2SK1056, 2SK1057, 2SK1058

Silicon N-Channel MOS FET

HITACHI

November 1996

Application

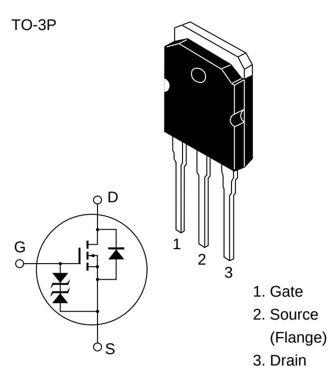
Low frequency power amplifier

Complementary pair with 2SJ160, 2SJ161 and 2SJ162

Features

- Good frequency characteristic
- High speed switching
- Wide area of safe operation
- Enhancement-mode
- Good complementary characteristics
- Equipped with gate protection diodes
- Suitable for audio power amplifier

Outline



Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Ratings	Unit
Drain to source voltage	2SK1056	V_{DSX}	120	V
	2SK1057		140	
	2SK1058		160	
Gate to source voltage		V_{GSS}	±15	V
Drain current		I_D	7	A
Body to drain diode reverse drain current		I_{DR}	7	A
Channel dissipation		Pch*[1]	100	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	–55 to +150	°C

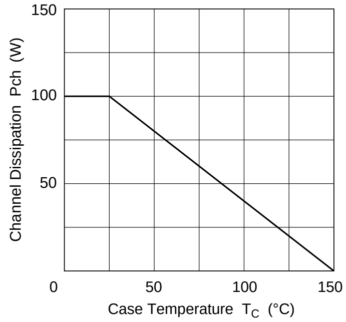
Notes 1. Value at T_C = 25°C

Electrical Characteristics (Ta = 25°C)

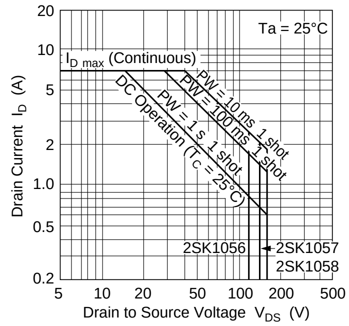
Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1056	$V_{(BR)DSX}$	120	—	—	V	I_D = 10 mA, V_{GS} = –10 V
	2SK1057		140				
	2SK1058		160				
Gate to source breakdown voltage		$V_{(BR)GSS}$	±15	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source cutoff voltage		$V_{GS(off)}$	0.15	—	1.45	V	I_D = 100 mA, V_{DS} = 10 V
Drain to source saturation voltage		$V_{DS(sat)}$	—	—	12	V	I_D = 7 A, V_{GD} = 0 *[1]
Forward transfer admittance		|yfs|	0.7	1.0	1.4	S	I_D = 3 A, V_{DS} = 10 V *[1]
Input capacitance		Ciss	—	600	—	pF	V_{GS} = –5 V, V_{DS} = 10 V, f = 1 MHz
Output capacitance		Coss	—	350	—	pF	
Reverse transfer capacitance		Crss	—	10	—	pF	
Turn-on time		t_{on}	—	180	—	ns	V_{DD} = 20 V, I_D = 4 A,
Turn-off time		t_{off}	—	60	—	ns	

Note 1. Pulse test

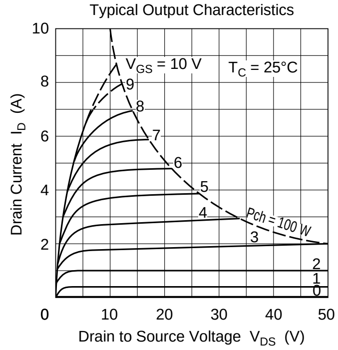
Power vs. Temperature Derating



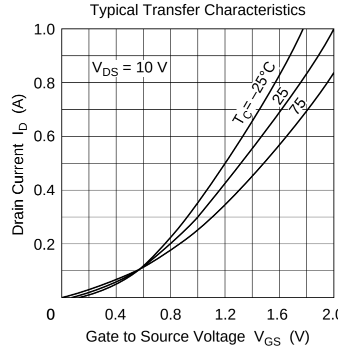
Maximum Safe Operation Area



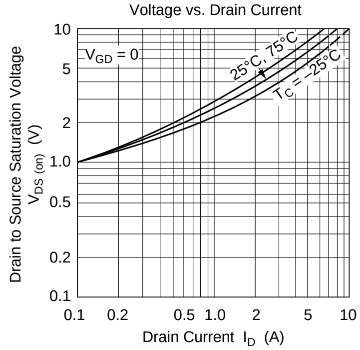
Typical Output Characteristics



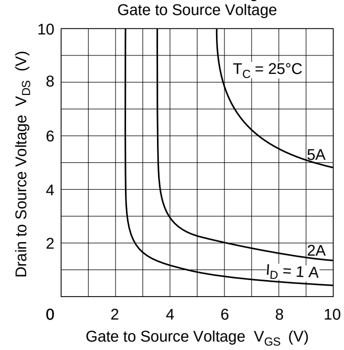
Typical Transfer Characteristics



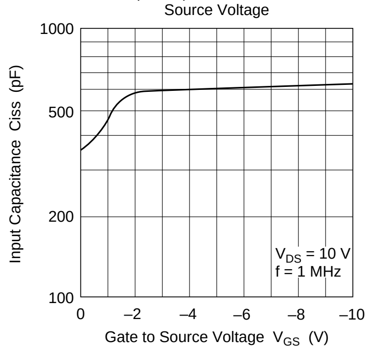
Drain to Source Saturation Voltage vs. Drain Current



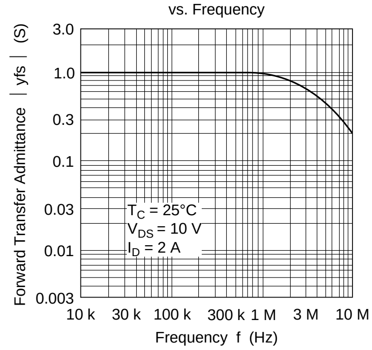
Drain to Source Voltage vs. Gate to Source Voltage

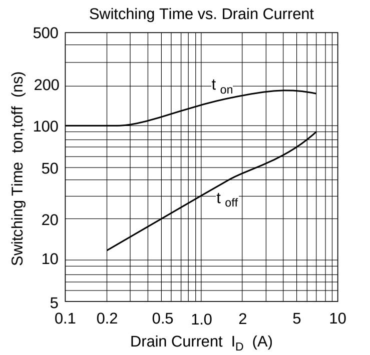


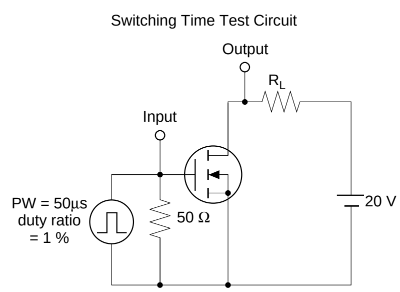
Input Capacitance vs. Gate Source Voltage

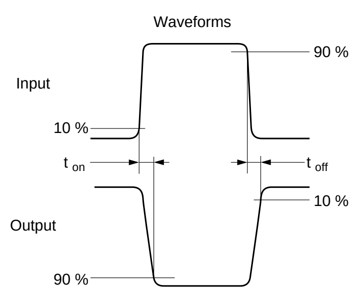


Forward Transfer Admittance vs. Frequency




Switching Time vs. Drain Current
Switching Time ton,toff (ns)
500
200
100
50
20
10
5
t on
t off
0.1
0.2
0.5
1.0
2
5
10
Drain Current I D (A)


Switching Time Test Circuit
Output
R L
Input
PW = 50µs
duty ratio
= 1 %
50 Ω
20 V


Waveforms
Input
90 %
10 %
t on
t off
10 %
Output
90 %

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